Scotch-Weld™
Polyurethane Reactive Adhesives
TE015 • TE030 • TE100 • TE200

Technical Data **July, 2005**

Product Description

3M™ Scotch-Weld™ Polyurethane Reactive Adhesives are a family of one-component, moisture curing, urethane adhesives. These adhesives are applied warm and bond a wide variety of substrates such as **wood**, fiber reinforced plastic (FRP) and many other plastics to themselves, to metal and to glass.

3M™ Scotch-Weld™ TE015 Extrudable, low viscosity adhesive has a fast set time ideal for bonding **wood.** Yields thin glue lines.

3M™ Scotch-Weld™ TE030 Extrudable grade with fast set time ideal for bonding **wood**. Also bonds selected plastics.

3M™ Scotch-Weld™ TE100 Extrudable grade with medium set time and low viscosity ideal for bonding **wood**. Bonds selected plastics. Yields thin glue lines.

3M™ Scotch-Weld™ TE200 Extrudable grade with fast set time, long open time ideal for bonding **wood.** Yields thin glue lines.

Features

- 100% solids
- Rapid rate of strength build-up
- Broad substrate adhesion
- Highly plasticizer resistant
- High strength bonds
- One component
- Various set times
- Can be used to bond heat sensitive materials

Typical Uncured Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

	3M™ Scotch-Weld™ Polyurethane Reactive Adhesive			
Property	**TE015**	**TE030**	**TE100**	**TE200**
Application Temperature	250°F (121°C)	250°F (121°C)	250°F (121°C)	250°F (121°C)
Viscosity (@250°F/121°C)[1]	7,000 cps	16,000 cps	7,000 cps	3,000 cps
Color (solid)	White/Off-White	White/Off-White	White/Off-White	White/Off-White
Open Time[2,4]	1.5 minute	1 minute	2 minutes	4 minutes
Set Time[3,4]	15 seconds	30 seconds	1 minute	2 minutes
Density, Lbs/Gallon (molten)	8.9	8.7	8.8	8.9

[1]Measured on Brookfield viscometer with Thermosel using spindle #27.

[2]The bonding range of a 1/8" bead of molten adhesive on a non-metallic substrate.

[3]The minimum amount of time required between when the bond is made and when it will support a 5 psi tensile load.

[4]Open times and set times are based on a room temperature environment. High temperatures will lengthen open times and set times while lower environmental temperatures will shorten open times and set times.

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Typical Cured Properties

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	3M™ Scotch-Weld™ Polyurethane Reactive Adhesive			
Property	**TE015**	**TE030**	**TE100**	**TE200**
Shore D Hardness[1]	65	60	61	60
Modulus[2]	25,000 psi	11,200 psi	12,200 psi	9,700 psi
Tensile Strength @ Break[2]	3,950 psi	3,800 psi	4,200 psi	4,000 psi
Elongation @ Break[2]	750%	725%	675%	625%

[1]Measured on .090" - .110" thick bars

[2]ASTM D 638, Die C, measured on .011" - .017" thick films cured 7 days at 77°F (25°C)/50% relative humidity (RH)

Handling/Curing Information

Directions for Use

Apply to clean, dry surfaces. Remove oil, grease and other contaminants by wiping with isopropyl alcohol.* For fiber reinforced plastics and other materials that are often contaminated with mold release agents, it is recommended that the surface be solvent wiped, abraded and solvent-wiped.* For additional information, see section on surface preparation. After heating to recommended application temperature, apply adequate amount of 3M™ Scotch-Weld™ Polyurethane Reactive Adhesive to one of the substrates to be bonded. Join the substrates within the adhesives specified open time and hold/fixture the bonded part until the adhesive has adequately set. Do not use to bond metal or glass to itself or each other or cure will not occur due to low moisture vapor transmission of the substrate.

(Important: Adhesive heated at application temperature for more than 16 hours should be discarded.)

***Note:** When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

Dispensing Equipment

3M™ Scotch-Weld™ Polyurethane Reactive Adhesive Cartridges can only be dispensed through the 3M™ Scotch-Weld™ Polyurethane Reactive Adhesive Applicator. Other container sizes can be dispensed through bulk equipment specifically designed for use with hot melt polyurethane reactive adhesives (P.U.R.). For more information on P.U.R. application equipment, contact your local 3M sales representative. All equipment must be used in strict accordance with the recommendations of the manufacturer.

WARNING: Do not use Scotch-Weld polyurethane reactive adhesive above 275°F (135°C). Scotch-Weld polyurethane reactive adhesive should not be applied to substrates that exceed 275°F (135°C).

Caution: Wear heat resistant gloves and safety glasses when handling.

Container sizes available: 10 fl. oz. cartridge, 2 kilogram foil bag, 1 gallon can, five gallon pail, 55 gallon drum.

Handling/Curing Information *(continued)*

Cleanup: Allow product to solidify. Remove uncured waxy material (usually within the first 20 minutes after application) by scraping with a putty knife or similar tool. For cured material, remove by cutting or sanding. **Do not use heat or flame to remove adhesive.**

Cure Time: The cure rate will vary depending on air temperature, relative humidity, substrate type and bond line thickness. Cure rate is more rapid on wood (moisture-rich substrate) than on plastic.

Typical Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

A. **Overlap Shear Strength**

Overlap shear (OLS) strengths were measured on 1" wide 1/2" overlap specimens. These bonds were made individually using 1" x 4" sample coupons. The thickness of the bond line was .003-.006". The thickness of the substrates were: plastics, .125", Maple, .375".

The separation rate of the testing jaws was 2" per minute.

Overlap Shear Strength (psi), tested @ 73°F (23°C)

	3M™ Scotch-Weld™ Polyurethane Reactive Adhesive			
Substrate	**TE015**	**TE030**	**TE100**	**TE200**
Maple	1,650	1,890	1,910	1,950
FRP	1,275[1]	2,380	2,550	1,700[1]
Polycarbonate	1,760	1,750	2,010	2,200[1]
Polyacrylic	1,150[1]	650	1,150[1]	1,250[1]
Polystyrene	370	580	200	650[1]
ABS	945[1]	770	920[1]	1,250[1]
PVC	1,150[1]	1,760[1]	2,100[1]	2,150[1]

[1]Substrate failure

Overlap Shear Strength (psi), tested @ 180°F (82°C)

	3M™ Scotch-Weld™ Polyurethane Reactive Adhesive			
Substrate	**TE015**	**TE030**	**TE100**	**TE200**
Maple	550	440	380	620
FRP	495	870	810	1550

Typical Performance Characteristics (*continued)*

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

B. **180° Peel Strength (piw)**

180° peel strengths were measured on 1" x 8" pieces of flexible cotton duck (canvas) bonded to rigid 1" x 4" substrates. The rigid substrates were approximately .125" thick and the separation rate of the testing jaws was 2" per minute. All strengths were measured at 73°F (23°C).

	3M™ Scotch-Weld™ Polyurethane Reactive Adhesive			
Substrate	**TE015**	**TE030**	**TE100**	**TE200**
FRP	28	84[1]	81[1]	80[1]
Polycarbonate	100[1]	55	77[1]	90[1]
Polyacrylic	21	13	29	46[1]
Polystyrene	NR	NR	NR	9
ABS	93[1]	55	70[1]	80[1]
PVC	100[1]	70[1]	70[1]	80[1]
Aluminum	NR	NR	NR	NR
Glass	NR	NR	NR	NR

[1]Cotton duck failed during test

[2]Note: 3M™ Scotch-Weld™ Polyurethane Reactive Adhesives TE030 and TE100 are not suggested for use on uncoated aluminum.

C. **Plasticized Vinyl, T-Peel (piw), tested @ 73°F (23°C)**

T-Peel strengths were measure on 1" wide pieces of plasticized vinyl at 73°F (23°C). The separation rate of the testing jaws was 2" per minute.

	3M™ Scotch-Weld™ Polyurethane Reactive Adhesive			
Condition	**TE015**	**TE030**	**TE100**	**TE200**
Initial	12	11[1]	12[1]	12
Aged @ 160°F (71°C) for 2 weeks	30	17[1]	22[1]	31[1]

[1]Substrate failure

Typical Performance Characteristics (*continued)*

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

D. **Typical Rate of Strength Build-Up**

FRP, Overlap Shear Strength (psi), tested @ 73°F (23°C) at various times after bonding. The FRP was conditioned for 7 days at 77°F (25°C)/50% RH prior to bonding.

	3M™ Scotch-Weld™ Polyurethane Reactive Adhesive			
Time	**TE015**	**TE030**	**TE100**	**TE200**
10 minutes	595	340	690	545
1 hour	835	610	1,120	530
24 hours	1,535	1,910	2,100	1,490
1 week	1,550*	2,380	2,550	1,700*

The cure rate will vary depending on air temperature, relative humidity, substrate and bond line thickness. Cure rate is more rapid on wood (moisture-rich substrate) than on plastic.
*Indicate substrate failure.

E. **Cure Cycle**

With the exception of rate of strength build-up, all bonds, unless otherwise noted, were cured for a minimum period of 7 days at 77°F (25°C)/50% RH before testing or subjecting to further conditioning or environmental aging. Bonds were prepared using the suggested procedure for the particular substrate tested.

Surface Preparation

Plastic: Wipe with isopropanol soaked cheesecloth.* Allow solvent to evaporate before bonding. Note: 3M™ Scotch-Weld™ Polyurethane Reactive Adhesives are not recommended for bonding untreated polyolefins.

Plastic contaminated with mold release: Wipe with isopropyl alcohol soaked cheesecloth, abrade with fine grit abrasive, wipe with isopropyl alcohol soaked cheesecloth.* Allow solvent to evaporate before bonding.

FRP, Rubber and Aluminum (uncoated): Wipe with methyl ethyl ketone (MEK) soaked cheesecloth, abrade with fine grit abrasive, wipe with MEK soaked cheesecloth.* Allow solvent to evaporate before bonding. Priming may be necessary on aluminum if part will be subjected to hot/humid conditions.

Glass: Wipe with MEK-soaked cheesecloth.* Allow solvent to evaporate before bonding. Priming may be necessary on glass if subject part will be subjected to hot/humid conditions.

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Storage

For maximum shelf life, store product at 60°F (16°C) to 80°F (27°C), indoors and protected from exposure to moisture.

Shelf Life

Products in 10 fluid ounce cartridges have 12 months while all others have a 6 month shelf life in unopened containers.

Precautionary Information

Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

Product Use

All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

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ISO 9001:2000

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